US009138830B2

(12) **United States Patent**
Mueller et al.

(10) **Patent No.: US 9,138,830 B2**
(45) **Date of Patent: Sep. 22, 2015**

(54) **METHOD FOR PRODUCING A FASTENING DEVICE**

(75) Inventors: **Joseph Mueller**, Hard (AT); **Andreas Fasske**, Magdeburg (DE)

(73) Assignee: **Hilti Aktiengesellschaft**, Schaan (LI)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 446 days.

(21) Appl. No.: **12/891,470**

(22) Filed: **Sep. 27, 2010**

(65) **Prior Publication Data**

US 2011/0076113 A1 Mar. 31, 2011

(30) **Foreign Application Priority Data**

Sep. 28, 2009 (DE) 10 2009 045 047

(51) **Int. Cl.**

B23K 31/02	(2006.01)
F16B 35/06	(2006.01)
B23K 26/26	(2014.01)
F16B 35/02	(2006.01)
F16B 37/14	(2006.01)

(52) **U.S. Cl.**

CPC ***B23K 31/027*** (2013.01); ***B23K 26/265*** (2013.01); ***F16B 35/02*** (2013.01); ***F16B 35/06*** (2013.01); ***F16B 37/145*** (2013.01); *B23K 2201/06* (2013.01); *B23K 2201/20* (2013.01); *Y10T 29/49826* (2015.01)

(58) **Field of Classification Search**

CPC F16B 35/02; F16B 35/06; F16B 37/145; Y10T 29/49826

USPC 470/2, 3, 4, 5, 6, 7, 48, 49, 50, 51, 52, 470/53, 8, 9, 10, 11, 12; 606/286, 289; 411/352, 353; 72/367.1, 368, 51

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

439,830	A *	11/1890	Berbecker	470/6
1,098,716	A *	6/1914	Garrison	470/8
1,742,201	A *	1/1930	Drissner	411/396
2,169,460	A *	8/1939	Broughton	411/403
2,366,459	A *	1/1945	Rosa	313/238
2,980,929	A *	4/1961	Cummaro	470/8
3,184,769	A *	5/1965	Barwood	470/4
3,832,747	A *	9/1974	Nankivell et al.	470/2
3,843,984	A *	10/1974	Bagheri et al.	470/8
3,924,508	A *	12/1975	DeCaro	470/11
3,945,071	A *	3/1976	Flodin	470/63
4,128,253	A *	12/1978	Powers	280/79.11
5,031,262	A *	7/1991	Baritz	470/5
5,059,211	A *	10/1991	Stack et al.	623/1.15
5,584,835	A *	12/1996	Greenfield	606/232
5,782,918	A *	7/1998	Klardie et al.	606/60
6,186,718	B1 *	2/2001	Fogard	411/403
6,394,724	B1 *	5/2002	Kelly et al.	411/353
6,644,903	B1 *	11/2003	Arand	411/352
6,685,409	B2 *	2/2004	Braun et al.	411/353
6,953,300	B2 *	10/2005	Chen	403/292
7,131,809	B2 *	11/2006	Dobson	411/533
7,481,829	B2 *	1/2009	Baynham et al.	606/289
8,114,141	B2 *	2/2012	Appenzeller et al.	606/328
2005/0257591	A1 *	11/2005	Hauger et al.	72/368
2006/0235410	A1 *	10/2006	Ralph et al.	606/72
2009/0129887	A1 *	5/2009	Chang	411/402
2011/0106177	A1 *	5/2011	Lewis	606/305

* cited by examiner

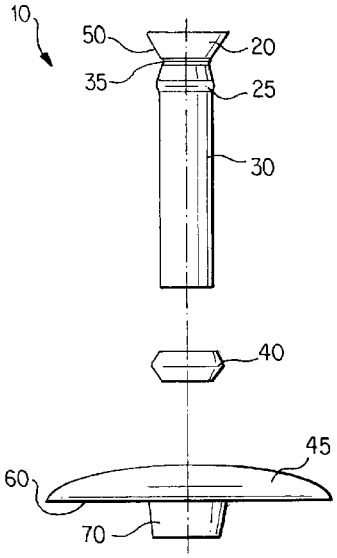
Primary Examiner — Edward Tolan

(74) *Attorney, Agent, or Firm* — Crowell & Moring LLP

(57) **ABSTRACT**

A method for producing a fastening device, in which a head part and a shaft part are joined, is disclosed.

18 Claims, 5 Drawing Sheets



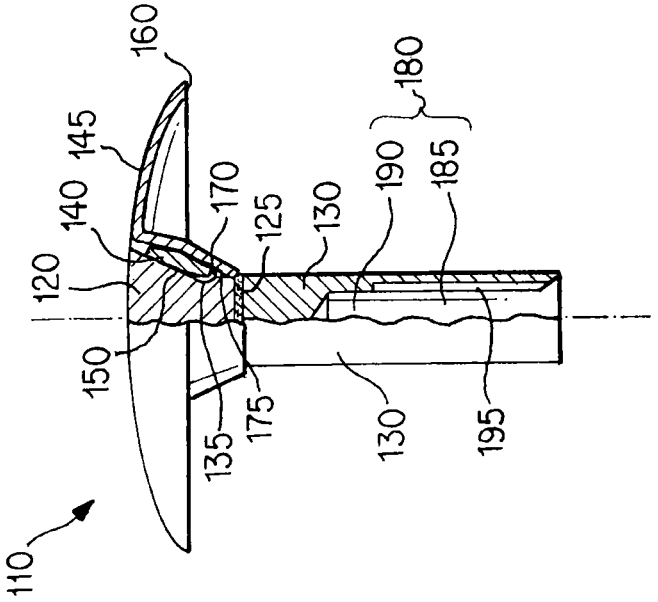

160
145
140
120
150
110
170
125
130
135
175
130
195
180
190
185

Fig. 2

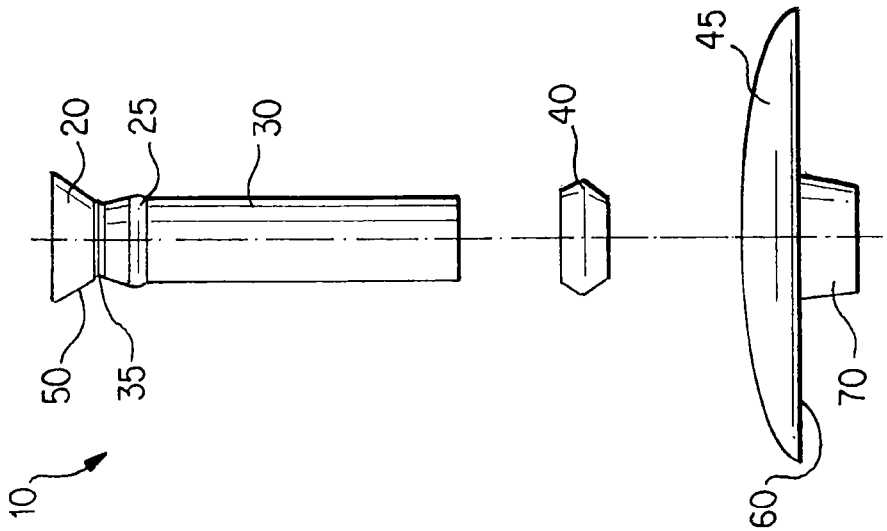

10
20
25
30
50
35
40
45
60
70

Fig. 1

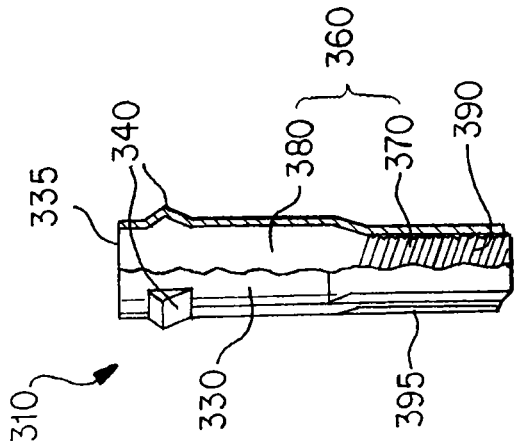

360
340
380
370
390
335
310
330
395

Fig. 4

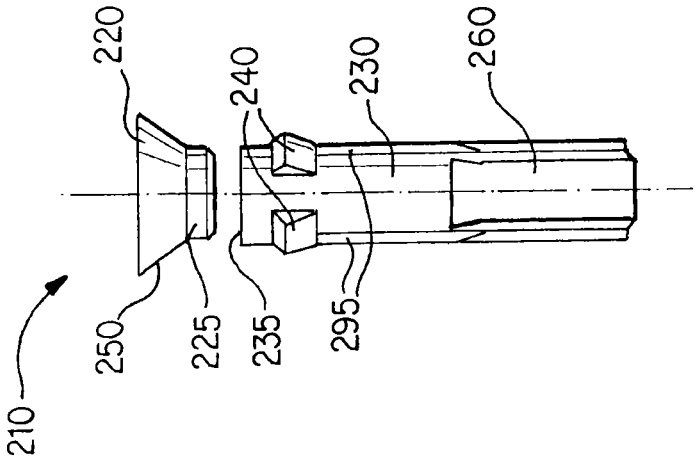

220
240
230
260
210
250
225
235
295

Fig. 3

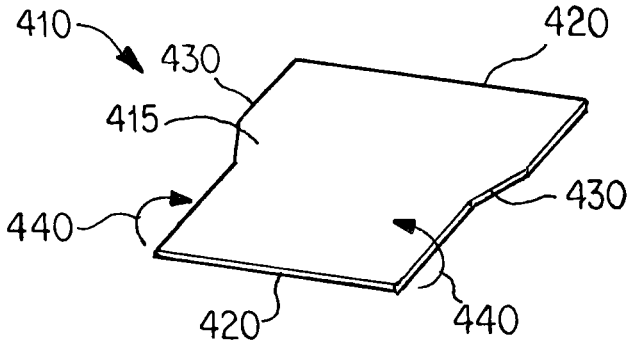


Fig. 5

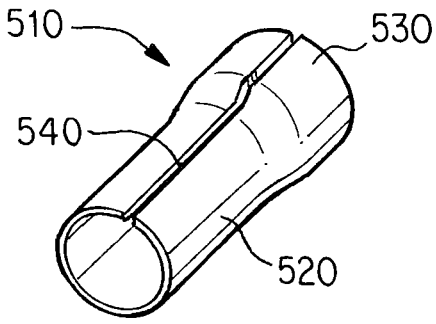


Fig. 6

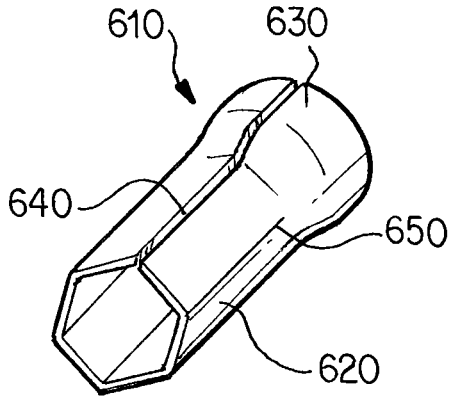


Fig. 7

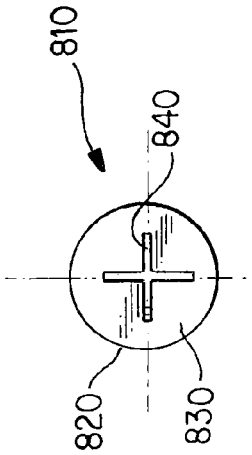


Fig. 9a

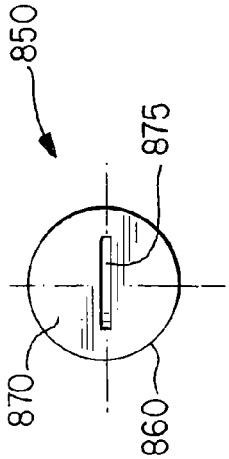


Fig. 9b

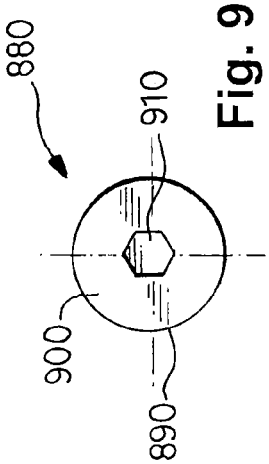


Fig. 9c

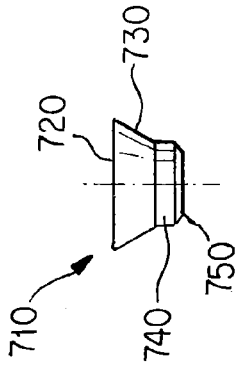


Fig. 8a

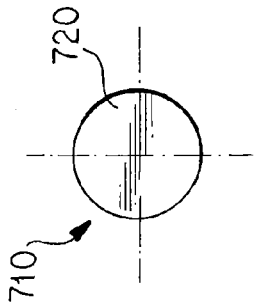


Fig. 8b

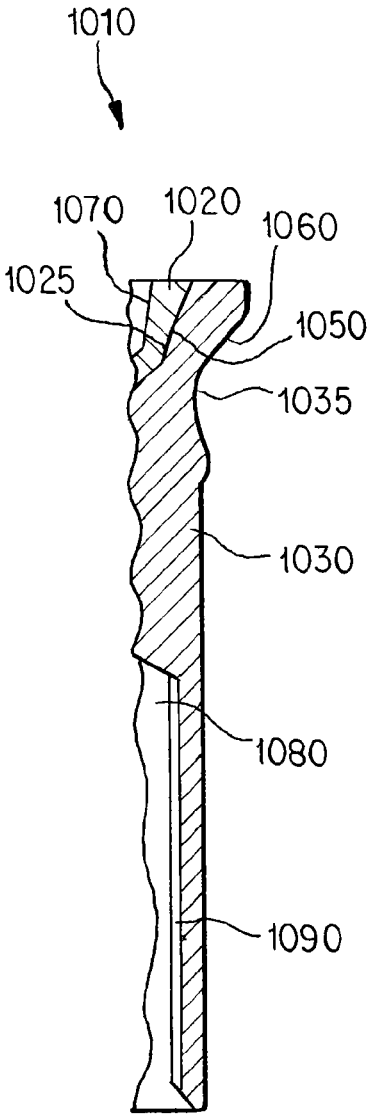

1010
1070
1020
1060
1025
1050
1035
1030
1080
1090

Fig. 10

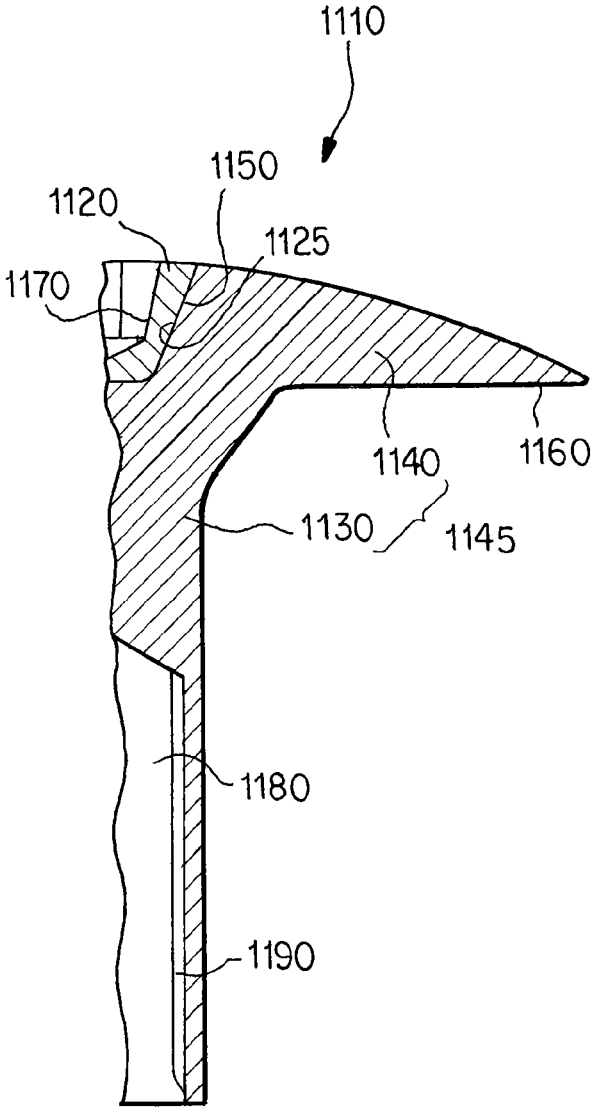

1110
1150
1120
1125
1170
1140
1160
1130
1145
1180
1190

Fig. 11

METHOD FOR PRODUCING A FASTENING DEVICE

This application claims the priority of German Patent Document No. 10 2009 045 047.5, filed Sep. 28, 2009, the disclosure of which is expressly incorporated by reference herein.

BACKGROUND AND SUMMARY OF THE INVENTION

The invention relates to a method for producing a fastening device, as well as such a fastening device.

Such devices are usually produced by integrally molding a head part onto a rod-shaped semi-finished product by massive forming and then milling a holder for a counterpart of the fastening device on a side opposite the head part. However, the milling operation in particular causes a great expenditure of time and materials.

It is the object of the present invention to make available a method for producing a fastening device that will consume less time and/or materials.

This object is achieved by a method for producing a fastening device in which a head part is joined to an abutment for a support of an object to be attached, and a shaft part with a holder for a counterpart of the fastening device. The head part and the shaft part are preferably welded together.

A preferred embodiment is characterized in that the shaft part is produced by shaping, in particular bending a semi-finished product. A flat semi-finished product is preferably used.

A preferred embodiment is characterized in that the holder comprises a loading area and an equalizing area having different cross-sections.

A preferred embodiment is characterized in that the holder, the loading area and/or the equalizing area have a circular cross-section. Another preferred embodiment is characterized in that the holder, the loading area, and/or the equalizing area have a polygonal cross-section.

A preferred embodiment is characterized in that the holder, the loading area and/or the equalizing area have a closed profile. A preferred embodiment is characterized in that the holder, the loading area and/or the equalizing area have an open profile.

A preferred embodiment is characterized in that the shaft part is provided with protrusions.

A preferred embodiment is characterized in that the holder, in particular the loading area, is provided with a loading structure. The loading structure especially preferably includes a thread.

A preferred embodiment is characterized in that the head part is produced by massive forming.

A preferred embodiment is characterized in that the abutment comprises a contact surface facing the shaft part. The contact surface especially preferably has an inclined area, in particular a conical area.

A preferred embodiment is characterized in that the head part is provided with a drive.

This object is also achieved by a device for fastening a first object onto a second object, having a head part and a shaft part, wherein the head part has an abutment for a support of the first object, and the shaft part has a holder for a counterpart of the fastening device, and having a joining location, which connects the head part to the shaft part.

The present invention is explained in greater detail below on the basis of exemplary embodiments with reference to the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows an exploded view of a fastening device;

FIG. **2** shows a side view and a sectional view of a fastening device;

FIG. **3** shows an exploded view of a fastening device;

FIG. **4** shows a side view and a sectional view of a shaft part of a fastening device;

FIG. **5** shows a perspective view of a semi-finished product;

FIG. **6** shows a perspective view of a shaft part of a fastening device;

FIG. **7** shows a perspective view of a shaft part of a fastening device;

FIGS. **8***a* and **8***b* shows a side view and a top view of a head part of a fastening device, respectively;

FIGS. **9***a*, **9***b*, and **9***c* show a top view of three fastening devices;

FIG. **10** shows a sectional view of a fastening device; and

FIG. **11** shows a sectional view of a fastening device.

DETAILED DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a device **10** for fastening a first object (not shown) onto a second object (also not shown) in an exploded view. This device **10** has a head part **20**, a shaft part **30**, a ring-shaped intermediate part **40** and a plate-shaped holding part **45**. The head part **20** and the shaft part **30** are welded together at a joining location **25**, so that the joining location **25** is designed as a peripheral weld. A laser welding method is preferably used for the joining here. In exemplary embodiments that are not shown here, the head part and the shaft part are joined by means of oxyfuel gas welding, electric arc welding, inert gas shielded arc welding, resistance welding, friction welding, electron beam welding, diffusion welding, hard or soft soldering, or by adhesive bonding.

The head part **20** has a peripheral recess **35**, which serves as a seat for the intermediate part **40** as soon as the intermediate part **40** is pulled up over the shaft part **30** onto the head part **20**. In addition, the head part has an abutment **50** for a support of the first object (not shown). The abutment **50** is designed as a conical contact surface for contact with the holding part **45**, such that this conical contact surface is facing the shaft part **30**. In an exemplary embodiment that is not shown here, the abutment has a planar surface or line, especially peripherally, facing the shaft part. The holding part **45** in-turn has a contact surface **60** for contact with the first object (not shown), for example a grating. In addition, the holding part has a collar-shaped feed-through **70** for the shaft part **30**. The feed-through is designed to be conical on the outside and preferably also on the inside, in particular to facilitate insertion of the shaft part **30**, for example.

FIG. **2** shows a device **110** for fastening a first object (not shown) onto a second object (also not shown) in a side view and a sectional view. This device **110** has a head part **120**, a shaft part **130**, a ring-shaped intermediate part **140** and a plate-shaped holding part **145**. The head part **120** and the shaft part **130** are welded together on a joining surface **125**, so that the joining location **125** is designed as a continuous welded connection. The head part **120** has a peripheral recess **135** in which the intermediate part **140** sits.

In addition, the head part has an abutment **150** for a support of the first object (not shown). The abutment **150** is designed

as a conical support surface for a support of the holding part **145** which faces the shaft part **130**. The holding part **145** in-turn has a contact edge **160** for contact with the first object (not shown). In addition, the holding part has a collar-shaped feed-through **170** for the shaft part **130**. The feed-through **170** has a conical inside surface **175**, which is opposite the abutment **150**, forming a gap, such that the intermediate part **140** is arranged between the abutment **150** and the inside surface **175**. Under some circumstances, this prevents or reduces interfering noise during load on the device **110**.

The shaft part **130** has a holder **180** for a counterpart (not shown) of the fastening device **110**. The holder **180** is designed as a blind hole and has a loading area **185** and an equalizing area **190**. The loading area **185** is provided with a peripheral recess **195**, in which the object can be secured.

FIG. **3** shows a device **210** for fastening a first object (not shown) onto a second object (also not shown) in an exploded view. The device **210** has a head part **220** and a shaft part **230** with chamfered or rounded longitudinal edges **295**.

The head part **220** has a cylindrical area **225** which has smaller outside dimensions, in particular a smaller diameter than the shaft part **230** on its end facing the head part **220**, so that the cylindrical area **225** forms a peripheral recess after joining the shaft part **230** to the head part **220**, this peripheral recess together with several protrusions **240** with which the shaft part **230** is provided serving as a seat for an intermediate part, for example, a sealing element and/or a damping element or the like or a holding part or the like. The protrusions **240** are uniformly distributed on the circumference of the shaft part **230** and are arranged in particular at an equal distance from the subsequent location **235** for joining to the head part **220**. The distance of one or all protrusions **240** from the subsequent joining location **235** is preferably the same as or smaller than the extent of the head part **220**, measured in the longitudinal direction of the shaft part **230**.

In exemplary embodiments that are not shown here, the shaft part is provided only with a single protrusion or the protrusions are arranged with different distances from one another and/or from the subsequent joining location. In the case of additional exemplary embodiments that are not shown, the cylindrical area has dimensions similar or identical to those of the shaft part, so that the protrusion(s) serve(s) only as a seat. In additional exemplary embodiments that are not shown, only the recess serves as a seat.

The head part **220** preferably has a conical abutment **250** for a support of the first object (not shown). The shaft part **230** has a holder **260** for a counterpart (not shown) of the fastening device **210**. The holder **260** has an open profile with one, two or more slots in the longitudinal direction. The holder **260** is designed with a loading structure, preferably an inside thread between the slots. In the exemplary embodiments that are not shown here, the holder has a blind hole or a feed-through passing through the shaft part, with or without a loading structure.

FIG. **4** shows a shaft part **330** of a device **310**, which is not shown further here, for fastening a first object onto a second object in a combined side view and sectional view. The shaft part **330** is provided with chamfered or rounded longitudinal edges **395** and protrusions **340**, which are uniformly distributed on the circumference of the shaft part **330** and are arranged at the same distance from a subsequent location **335** for joining to a head part (not shown).

The shaft part **330** has a holder **360** for a counterpart (not shown) of the fastening device **310**. A holder **360** is designed as a feed-through passing through the shaft part **330** and has a loading area **370** and an equalizing area **380**. The loading area **370** is provided with an inside thread **390** into which a counterpart furnished with an outside thread can be screwed. The equalizing area **380** has larger inside dimensions, in particular a larger inside diameter than the loading area, so that under some circumstances, the manufacturing cost and/or complexity for the inside thread **390** is reduced. The equalizing area **380** serves to equalize the space for the counterpart in particular. In an exemplary embodiment that is not shown here, the equalizing area has smaller inside dimensions than the loading area and serves as a stop for the counterpart, for example.

FIG. **5** shows a semi-finished product **410** for producing a shaft part of a device for fastening a first object onto a second object in a perspective view. The semi-finished product **410** has a flat shape and is designed as a sheet made of metal, an alloy, a steel or stainless steel, for example. The semi-finished product **410** has an inside surface **415** having straight transverse edges **420** and S-shaped longitudinal edges **430**, so that a width of the semi-finished product measured in the direction of the transverse edges **420** is smaller on the side facing the observer than on the side facing away from the observer.

To produce a shaft part, the semi-finished product **410** is curved into a round shape along the arrows **440** to form a sleeve shape, so that the longitudinal edges **430** are opposite one another. Next the longitudinal edges **430** are joined together, in particular being welded together, so that a shaft part having a closed profile is formed, with a continuous holder, i.e., a holder that is open on both sides, being formed in its interior. A laser welding method is preferably used for joining. In exemplary embodiments that are not shown here, the longitudinal edges are joined by means of oxyfuel gas welding, electric arc welding, inert gas shielded arc welding, resistance welding, frictional welding, electron beam welding, diffusion welding, hard soldering or soft soldering or adhesive bonding.

Because of the difference in width of the semi-finished product on different sides, a holder having a cylindrical loading area of a smaller inside diameter and a cylindrical equalizing area of a larger inside diameter is formed. With this method, it is possible to save on both time and materials in comparison with milling of a holder of a solid material. In exemplary embodiments that are not shown here, two or more flat semi-finished products are shaped into half cylinders and/or partial cylinders to produce a shaft part, such that two longitudinal edges are opposite one another at several locations on the circumference, and these edges are then joined to one another.

As an additional process step, a loading structure is molded shaped into the holder. An inside thread is preferably shaped into the loading area, in particular being cut there. Before or after that, the shaft part is joined to the head part along one of the transverse edges **420**, in particular on the wider transverse edge. The joining to the head part is preferably performed simultaneously with and/or in a single method step with the joining of the longitudinal edges **430**. However, in exemplary embodiments that are not shown here, the joining to the head part is performed before or after the joining of the longitudinal edges.

FIG. **6** shows a shaft part **510** of a device for attaching a first object onto a second object in a perspective view. The shaft part **510** has a loading area **520** as well as an equalizing area **530**, each having a circular cross-section, such that the equalizing area **530** has a larger inside diameter than the loading area **520**.

The shaft part **510** is designed as an open profile having a longitudinal gap **540**. In contrast with the equalizing area **530**, the loading area **520** is provided with a loading structure designed as an inside thread.

FIG. **7** shows a shaft part **610** of a device for fastening a first object onto a second object in a perspective view. The shaft part **610** has a loading area **620** with a hexagonal cross-section and an equalizing area **630** with a circular cross-section, such that the equalizing area **630** has larger inside dimensions than the loading area **620**. The longitudinal edges **650**, which are formed by the six corners of the cross-section of the loading area, are rounded or chamfered.

In exemplary embodiments which are not shown here, the loading area and/or the equalizing area have a triangular, rectangular, pentagonal, octagonal, decagonal or dodecagonal cross-section with the same or different side lengths.

The shaft part **610** is designed as an open profile having a longitudinal gap **640**. In contrast with the equalizing area **630**, the loading section **620** is provided with a loading structure designed as an inside thread. Due to the polygonal cross-section of the loading area, it is sufficient to produce the inside thread in the center of the side faces of the respective polygon.

FIG. **8** shows a head part **710** of a device for fastening a first object onto a second object in a side view (FIG. **8***a*) and in a top view (FIG. **8***b*). The head part **710** has a circular drive surface **720** and an abutment **730** designed as a conical contact surface for contact of a first object to be attached. In addition, the head part **710** has a cylindrical protrusion **740** with a chamfered peripheral edge **750**. The head part **710** is preferably produced by massive forming, especially preferably by flow pressing. In an exemplary embodiment that is not shown here, the head part is produced by means of milling.

The head part is preferably made of a metal, an alloy, a steel or stainless steel. The head part is especially preferably made of the same material as the respective shaft part. However, in exemplary embodiments that are not shown here, the head part and/or the shaft part are made of plastic and in particular are applied to the respective other one of the two parts by an injection molding process. According to additional exemplary embodiments that are not shown here, a holding part such as that shown in FIG. **1** or **2**, for example, is made of plastic and in particular is attached to the head part and/or the shaft part by means of an injection molding process.

According to a variant that is preferred in particular, the head part is made of a metal, an alloy, a steel, stainless steel or some other material which has a high hardness, provided with a drive and sheathed with a combined shaft and holding part made of plastic, so that the drive is stable for engagement of a tool, and the shaft part and the holding part are designed from a lightweight and/or inexpensive material.

FIG. **9** shows three devices **810** (FIG. **9***a*), **850** (FIG. **9***b*), **880** (FIG. **9***c*) for attaching a first object onto a second object, each shown in a view from above. The device **810** has a head part **820** with a circular drive surface **830**. The drive surface **830** has a drive **840**, which is designed as a cross recess, which is used for engagement of a tool (not shown). With the help of this tool, it is possible in particular to screw the device **810** onto a counterpart designed as a screw having an outside thread and thus to attach a first object, for example, a grating, to a second object, for example, a substrate. The counterpart is preferably designed as a direct-fastening element, which is driven into the substrate with the help of a setting tool. According to an especially preferred exemplary embodiment, the counterpart is anchored in a borehole in the substrate by means of a dowel, for example.

The device **850** has a head part **860** with a circular drive surface **870**. The drive surface **870** has a drive **875** designed as a longitudinal slot, which serves to allow engagement of a tool (not shown). The device **880** has a head part **890** with a circular drive surface **900**. The drive surface **900** has a drive **910** designed as a hexagon socket, serving to allow engagement of a tool (not shown).

FIG. **10** shows a device **1010** for fastening a first object (not shown) to a second object (also not shown) in a longitudinal sectional view. The device **1010** has a head part **1020**, a shaft part **1030** and a plate-shaped holding part (not shown). The head part **1020** and the shaft part **1030** are bonded to one another at a joining surface **1025**. The shaft part **1030** has a peripheral recess **1035**, in which the holding part sits. In addition, the head part **1020** has an abutment **1050** for a support of the first object (not shown). The abutment **1050** is designed as a conical contact surface, which overlaps with the joining surface **1025**, in particular corresponding to the joining surface **1025**. The shaft part **1030** in-turn has a contact surface **1060** for contact of the holding part (not shown). The shaft part **1030** also has a holder **1080** designed as a blind hole for a counterpart (not shown) of the fastening device **1010**. The holder **1080** is provided with a loading structure **1090** designed as a thread in particular in which the counterpart is held.

The head part **1020** has a drive **1070** which is designed in particular as a hexagon socket and which serves to allow engagement of a tool (not shown). With the help of this tool, it is possible in particular to screw the device **1010** onto a counterpart designed as a screw with an outside thread and thus to attach a first object, for example, a grating, onto a second object, for example a substrate.

For the transmission of force and/or torque from the tool to the head part **1020**, the head part **1020** is preferably manufactured from a first material, in particular a metal or an alloy, for example, steel or stainless steel, a ceramic or the like. The shaft part **1030** is preferably manufactured from a second material, in particular plastic, which is different from the first material and is cast on or integrally molded onto the head part **1020** in particular. For transmission of a force and/or torque from the head part onto the shaft part **1030**, the joining surface **1025** and/or the abutment **1050** has a profile which forms a form-fitting connection between the head part **1020** and the shaft part **1030**. The profile therefore has a cross-section with a noncircular perimeter. The perimeter is in particular elliptical, a regular or irregular polygon and/or has one or more protrusions and/or recesses.

FIG. **11** shows a device **1110** for fastening a first object (not shown) onto a second object (also not shown) in a longitudinal sectional view. The device **1110** has a head part **1120** and a combined shaft and holding part **1145** having a shaft area **1130** and a plate-shaped holding area **1140**. The head part **1120** and the combined shaft and holding part **1145** are bonded to one another, substance-to-substance, at a joining surface **1125**. The head part **1120** has an abutment **1150** for a support of the first object (not shown). The abutment **1150** is designed as a conical contact surface, which overlaps with the joining surface **1125**, in particular corresponding to the joining surface **1125**. The combined shaft and holding part **1145** in-turn has a contact surface **1160** in its holding area **1140** for contact of the first object (not shown). The combined shaft and holding part **1145** also has a holder **1180**, which is designed as a blind hole in its shaft area **1130**, for a counterpart (not shown) of the fastening device **1110**. The holder **1180** is provided with a loading structure **1190**, which is designed in particular as a thread and in which the counterpart is held.

The head part **1120** has a drive **1170**, which is designed as a hexagon socket and serves to provide engagement for a tool (not shown). With the help of this tool it is possible in par-

ticular to screw the device **1110** onto a counterpart, which is designed as a screw with an outside thread.

For a transmission of force and/or torque from the tool to the head part **1120**, the head part **1120** is preferably made of a first material, in particular a metal or an alloy, for example, steel or stainless steel, a ceramic or the like. The combined shaft and holding part **1145** is preferably manufactured from a second material, which is different from the first material and is plastic in particular, and is cast on or integrally molded onto the head part **1120** in particular. For a transmission of force and/or torque from the head part **1120** to the combined shaft and holding part **1145**, the joining surface **1125** and/or the abutment **1150** has a profile, which forms a form-fitting connection between the head part **1120** and the shaft part **1130**. The profile therefore has a cross-section with a noncircular perimeter. The perimeter is in particular elliptical, a regular or irregular polygon and/or has one or more protrusions and/or recesses.

The present invention has been described on the basis of examples of a device for fastening a first object onto a second object as well as a manufacturing method for such a device. The features of the embodiments described here may also be combined with one another in any desired manner within a single fastening device and/or a single manufacturing method. It should also be pointed out that the inventive device and the inventive method are also suitable for other purposes.

The foregoing disclosure has been set forth merely to illustrate the invention and is not intended to be limiting. Since modifications of the disclosed embodiments incorporating the spirit and substance of the invention may occur to persons skilled in the art, the invention should be construed to include everything within the scope of the appended claims and equivalents thereof.

What is claimed is:

1. A method for producing a fastening device, comprising the steps of:

producing a shaft part by curving a flat semi-finished product into a round shape to form a sleeve shape;

joining a head part to the shaft part, wherein the head part has an abutment for support of an object to be attached and wherein the shaft part defines a bore within the shaft part for a counterpart of the fastening device; and

inserting the shaft part through a plate-shaped holding part and contacting the plate-shaped holding part with the abutment of the head part;

wherein the step of inserting the shaft part through the plate-shaped holding part includes inserting the shaft part through a collar-shaped feed-through of the plate-shaped holding part and wherein the collar-shaped feed-through is conical on an outside and an inside of the feed-through.

2. The method according to claim **1**, wherein the head part and the shaft part are welded together.

3. The method according to claim **1**, wherein the bore includes a loading area and an equalizing area having different cross-sections.

4. The method according to claim **1**, wherein the bore has a circular cross-section.

5. The method according to claim **1**, wherein the bore has a polygonal cross-section.

6. The method according to claim **3**, wherein the loading area and/or the equalizing area have a closed profile.

7. The method according to claim **3**, wherein the loading area and/or the equalizing area have an open profile.

8. The method according to claim **1**, wherein the shaft part is provided with protrusions.

9. The method according to claim **1**, wherein the bore includes a loading structure.

10. The method according to claim **9**, wherein the loading structure includes a thread.

11. The method according to claim **1**, wherein the head part is produced by massive forming.

12. The method according to claim **1**, wherein the abutment comprises a contact surface facing the shaft part.

13. The method according to claim **1**, wherein the head part is provided with a drive.

14. The method according to claim **1**, wherein the bore is a blind hole.

15. The method according to claim **1**, wherein the bore is a feed-through passing through the shaft part.

16. The method according to claim **1**, wherein longitudinal edges of the flat semi-finished product are joined together such that the shaft part has a closed profile.

17. The method according to claim **1**, wherein a gap is defined between longitudinal edges of the flat semi-finished product such that the shaft part has an open profile.

18. The method according to claim **1**, further comprising the step of pulling up an intermediate part over the shaft part and onto the head part and seating the intermediate part in a peripheral recess of the head part.

* * * * *